Focus on the problems you can control or manage!

- Nutrition - broadcast fertilize with the best available palm fertilizer
- Prune correctly - don’t abuse your palms; sterilize pruning tools
- There is no perfect palm!
- Diversify your landscape!
figure: Broschat and Meerow, 2000
Top Four Palm Nutritional Deficiencies

Potassium (K)
Magnesium (Mg)
Manganese (Mn)
Boron (B)

All combinations!
Nutritional Deficiencies

• Leaf symptoms remain forever, especially necrotic (dead) tissue

• Correction of problem requires growth of nutritionally sufficient leaf tissue

• It may take 2-4 years to replace canopy

• Goal is prevention of deficiencies
Potassium (K) Deficiency

- Translucent yellow-orange or necrotic spotting of foliage
- Marginal and/or leaflet tip necrosis (brown due to death)
- Most severe on oldest (lowest) leaves and towards tips of affected leaves
Translucent yellow-orange spotting
Easiest to see if hold leaf up to light
Necrotic spotting of leaflets
Marginal necrosis on fan palm leaf

Marginal necrosis on leaflet tips of feather palm
• Most severe on oldest leaves

• Most severe on leaf tip, decreasing towards leaf base

• Leaf petiole remains green; last leaf part to become necrotic
K deficiency leaves linger in half dead state for weeks and months.

Natural senescence occurs within a few days.
## Number of leaves retained

<table>
<thead>
<tr>
<th>Species</th>
<th>-K</th>
<th>+K</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cocos nucifera</em></td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td><em>Phoenix canariensis</em></td>
<td>65</td>
<td>130</td>
</tr>
</tbody>
</table>
Magnesium (Mg) Deficiency

- Marginal chlorosis (yellowing) of leaflets or leaves
- Central part of leaflets or leaf segments remain distinctly green
- No necrosis of leaf tissue
- Most severe on oldest (lowest) leaves
Mg: yellow margins
K: brown margins
Mg: yellow margins    K: brown margins

- Mg deficiency occurs naturally primarily on *Phoenix canariensis* (Canary Island date palm)
- Mg deficiency induced on most other palms by improper fertilization
Manganese (Mn) Deficiency

• Interverinal chlorosis with necrotic streaking
• Withering or frizzling of leaflet or leaf segment tips
• Death of meristem (bud)
• Affects newest leaves only
• More severe at leaf base than tip
• Interveinal chlorosis AND necrosis

• More common on feather-leaf palms
Mn deficiency:
• Youngest leaves are affected
• Leaflets closest to trunk are affected
• Opposite of K deficiency
Frizzletop = Mn deficiency
Meristem (bud) is killed

Queen palm with BOTH K and Mn deficiencies
Boron (B) Deficiency

- Stunted, necrotic-tipped leaves
- Multiple, incompletely opened spear leaves (should only be one unopened spear leaf at one time)
- Abortion of flowers and fruits
- Horizontal growth
- Death of meristem (bud)
- “Accordian” leaf symptoms
- Affects newest leaves
Multiple, unopened new leaves

“Accordian” leaf symptoms
Horizontal growth

It will begin to grow upright again if boron deficiency is corrected - takes years
While deficient soils can be a cause of palm nutrient deficiencies, most are due to improper fertilization – especially turf fertilizers with high N content.
Fertilizing Mixed Landscapes

Common Deficiencies

• Turf: N, Fe
• Broadleaf Trees and Shrubs: Mg, Fe, K, Mn, N
• Palms: K, Mn, B, Mg, Fe, N

Palm deficiencies include all of the turf and broadleaf trees and shrubs deficiencies
Fertilizing Mixed Landscapes

Why integrated approach?

- All types of plants are growing in same deficient soil
- Palm and tree roots coexist with turf roots
- Products applied to turf can be harmful to palms and trees
- Simplicity!!!
Fertilizing Landscape Plants

• Use 8-2-12-4Mg with micronutrients
• Type of materials just as important as ratio
• N, K and Mg in 100% controlled release form
• Micronutrients: form depends on nutrient
  • N – any controlled-release form acceptable
  • K – sulfur-coated potassium sulfate
  • Mg – prilled kieserite (special form of MgSO₄)
  • Mn – sulfate (e.g., TechMangam)
  • Fe – chelate (Tracheline Fe)
  • B – slow-release forms (e.g., Granubor)
Release Patterns of Soluble and Controlled Release Fertilizers

Plant needs
Soluble (K)
Controlled release (N)

Many turf fertilizers have these characteristics.
Release Pattern of N, K and Mg in 8-2-12-4Mg Palm Fertilizer

Weeks

Plant needs
Controlled Release N, K and Mg
Where to find 8-2-12-4Mg?

• Number of companies formulate this fertilizer in Florida, but most are only accessible to professional landscapers.

• John Deere Landscapes (LESCO)
  http://www.johndeerelandscapes.com
  click on “branch locator”
Fertilizing Landscape Plants

- **Broadcast** 15 lbs fertilizer (not N) per 1000 sq. ft. of bed or canopy area every 3 months with 8-2-12-4Mg with micros

- Fertilize turf within 50 ft. of any palm with recommended 8-2-12-4Mg with micros; it won’t hurt the turf, but use less (12.5 lbs)

- If you can’t use the correct fertilizer, better to use no fertilizer at all near palms!
Fertilizing Landscape Plants

If you are located in an area that prohibits:

• P all year, use 8-0-12-4Mg (same rate)

• N and P during the summer months, apply 8-2-12-4Mg in Feb., May and Nov., but 0-0-16-6Mg in Aug. (same rate)
Palm Pruning
- affects palm vigor
- affects palm nutritional health
- can transmit diseases
- can reduce vermin
- can affect cold hardiness
Self-cleaning vs. Non self-cleaning

crown shaft

no crown shaft
K deficiency leaves linger in half dead state for weeks and months.

Natural senescence occurs within a few days.
How much to remove?
If deficiencies exist, remove only dead leaves

Never remove leaves at angle above the horizontal (9:00–3:00 position on clock)
Palm Abuse: Pruning Palm to Death!!
K is a mobile element
Palm Abuse!!

- Fusarium Wilt
- Palm Weevils
- K & Mg Def.
Hurricane
Cut
What to trim?
-dead leaves & fruit stalks
-flower stalks?
-fruit stalks?
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